

Example from Allott Biology for the IB Diploma: To test whether there was any difference in the size of lichens growing on the top and side of a stone wall, some data were collected. The diameters of a random sample of ten lichens on the top of the wall and ten growing on the side were measured and a *t*-test was used to find out if there was a significant difference.

Surface	Diameter of lichen (mm)									
Top	22	10	24	45	9	26	5	34	10	13
Side	22	12	23	13	7	13	5	24	3	10

1. Enter the data into two columns in excel.
2. Highlight the empty cell below the second column.
3. Click on the  $f_x$  button and choose ttest. (you might need to scroll through the list of functions)
4. Array 1 refers to the location of the first column of data. Highlight the data from A1 to A10 and the box will fill in.
5. Click in the array 2 box. Highlight the data from B1 to B10.
6. The number of tails is two if you are testing whether there is a significant difference in means whereas a one-tailed test is whether you are testing the hypothesis that the one mean is greater than the other. Both could apply in this case. We choose the two-tailed test.
7. For type we are assuming equal variance in the two samples, so choose type '2'.
8. A 'p' value of .176 indicates that the difference in means is not statistically significant.

